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AUTHOR	Campoy, Renee W.; Radcliffe, Richard
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ABSTRACT

This paper presents descriptive research comparing levels of cognitive and reflective development among preservice and inservice teachers. A question about the effectiveness of the state educational reform law was used to collect data identifying student reflection levels. The question was presented as a written assignment to undergraduates in an assessment course (taken just prior to student teaching) and graduate students in an educational theory course. Data analysis indicated that how respondents made use of evidence related to undergraduate/graduate status and school level (elementary, middle, or high school). Results found no significant differences between undergraduates and graduates in their knowledge scores. There was no correlation between years of teaching and knowledge level scores. Half of the inservice and preservice teachers scored at knowledge level three, which implied that they would believe what they read or heard regarding educational approaches without ascertaining biases, considering multiple sources of evidence, or determining context. Regarding justification levels, there was a small mean difference between undergraduate and graduate students which revealed that scores of graduate students exceeded those of undergraduate students by a small measure. Some respondents scored a full level higher in justification than in knowledge. (Contains 28 references.) (SM)

Reflective Decision-Making and Cognitive Development: A Descriptive Study Comparing the Reflective Levels of Pre-service and In-service Teachers

Presented by

Renee W. Campoy, EdD.
Murray State University
& Richard Radcliffe, PhD.
Southwest Texas University

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Reflective Decision-Making and Cognitive Development: A Descriptive Study Comparing the Reflective Levels of Pre-service and In-service Teachers

A. Objective

To present descriptive research comparing levels of cognitive and reflective development in pre-service and in-service teachers. To offer instructional strategies in order to increase the reflective levels of pre-service and in-service teachers.

Reflection advocated by many educational leaders as an important process for facilitating teachers to engender good classroom practices (Colton & Sparks-Langer, 1993; Dewey, 1933; Mezirow, 1991; Schon, 1987, 1983; Tom, 1999). Many investigators have examined the use of reflection in the teaching and learning process (Bennett, 1996; Campoy, 2000; Cooper, 1996; Diss, Buckley & Pfau, 1992; Dollase, 1996; Egan, 1996; Fernandez-Balboa & Marshall, 1994; Kouba, 1994; Oppewal, 1993; Pultorak, 1996; Riggs & Sandlin, 1996; Stoiber, 1991; Wilson & Ball, 1996; Wise, Spiegel & Bruning, 1999). Reflective decision making is also incorparated in national and state standards. An INTASC (Interstate New Teacher Assessment and Support Consortium) standard states that the teacher is, "a reflective practitioner who continually evaluates the effects of his/her choices and actions on others (students, parents, and other professionals in the learning community) and who actively seeks out opportunities to grow professionally" (Darling-Hammond, Wise, & Klein, 1995, p. 187). A Kentucky New Teacher Standard specifies

that teachers, "reflect on and evaluate specific teaching/learning situations and/or programs" (Kentucky Education Professional Standards Board, 1999).

Often, written reflections that address teacher standards are the most critical component of teachers' professional portfolios. The researchers have found that in-service and pre-service teacher reflections demonstrate a wide range in quality. As a result, the researchers wanted to investigate the range of quality in reflection and to compare the reflective levels of in-service and pre-serviced teachers in order to gain insight about how to improve reflection with instruction.

B. Theoretical Framework

A search of theories to explain different levels of reflection uncovered a long and distinguished history of cognitive development theory. Piaget (1965), identified two stages of moral judgment by observing children's games and by asking questions about the consequences of broken dishes. Piaget's work was advanced by Kohlberg (1981) who utilized Piaget's methodology of telling stories and asking questions. Kohlberg expanded Piaget's two stages into six that described how individuals develop moral thinking during childhood and adolescence. Kohlberg suggested that these stages were culturally and historically universal and asserted that individuals will progress through stages of moral development, as long as they are provided proper environmental support. Gilligan (1982) took issue with Kohlberg's stages claiming they were biased in favor of culturally masculine models of justice. Gilligan challenged Kohlberg's "justice orientation" of morality with her own "care orientation" of morality. Other researchers have noted that the underlying

concepts of the two approaches are similar and they have called for an integrative approach that includes both perspectives (King & Kitchener, 1994).

Perry (1981), perplexed by student's contradictory perceptions of his courses and teaching and was prompted to investigate his students' cognitive development. Perry determined that students evaluated his courses based on their understanding of the nature of knowledge. He made specific connections between students' responses to college assignments and their ethical and cognitive developmental levels and developed a model comprising nine cognitive and ethical stages. King and Kitchener (1994) also targeted an adult population and expanded Perry's model of knowledge development to include how students utilize evidence to support their opinions. The King and Kitchener model of reflective judgment includes both concepts of justification and views of knowledge forming seven developmental stages.

C. Method of Inquiry

This study used the King and Kitchener model (1994) to assess pre-service and in-service teacher's levels of reflective knowledge and justification. King and Kitchener (1994), Perry (1981), and Gilligan (1982) all used interviews to determine participants' reflective levels. Rather than interviews, the current researchers wanted to investigate a more practical way, specifically, a written assignment, to determine if they could identify student's level of reflective judgment. Like King and Kitchener, the current research used ill-structured problems to determine reflective judgment. In addition, the topic had to be familiar to a wide range of individuals. A question about

the effectiveness of the state educational reform law was selected as the means to collect data in order to identify levels of student reflection. This question was determined to be highly appropriate for eliciting a thoughtful responses since pre-service and in-service teachers were likely to be knowledgeable about and have opinions concerning high stakes assessment polices. The question was presented as a written assignment to undergraduates in an assessment course and to graduate students in an educational theory course. A rubric based on the King and Kitchener model of reflective judgment was developed to score student responses (Figure 1).

For the undergraduate respondents, the assessment course was taken immediately before the student teaching semester. The graduate respondents were at various stages in their program. All respondents maintained a GPA of 2.5 or higher. The assignments were presented by full-time program faculty who used the same directions for explaining the assignment and the same rubric for scoring the results. The assignments were blind scored by the course instructors who attained an inter-rater reliability exceeding 90%.

Figure 1 Reflective Judgment Rubric

Knowledge Levels

1. What I have seen is true (concrete view of knowledge, knowledge exists absolutely, and knowledge is not understood as an abstraction)

2. There is a true reality that can be known with certainty, but it may not be known by everyone. Experts "know" the true reality.

3. Authorities may not know now, but they will know in the future. Knowledge is certain.

4. One can not know with certainty. Knowing is idiosyncratic to the individual since situational variables may force ambiguity.

5. There are different ways of knowing. Knowing is contextual and subjective because it is filtered through one's perceptions. The beholder may recognize different ways of knowing but can not integrate them.

6. Knowledge is constructed on the basis of information gathered from a variety of sources.

7. Knowledge is the outcome of a process of inquiry in which solutions are constructed from a variety of integrated sources.

Justification Levels

1. Justification is not needed or not relevant (beliefs need no justification; there is absolute correspondence between what is believed to be true and what is true).

2. Beliefs are unexamined and unjustified, or justified by an authority figure.

3. If authorities do not yet know, the thinker will use their own feelings or beliefs as justification.

4. Beliefs are justified by evidence, but the arguments and choice of evidence are idiosyncratic. The thinker does not acknowledge qualitative differences between experts and non-experts, and may dismiss authorities as biased.

5. Beliefs are justified by rules of inquiry for that context. The thinker realizes that different rules of justification exist for different contexts, but can not integrate them into a structure.

6. Beliefs are compared based on evidence and opinions from different perspectives, and solutions are constructed that are evaluated by multiple criteria.

7. Beliefs are justified probabilistically on the basis of a variety of interpretive considerations, such as the weight of evidence, the explanatory value of the interpretation, the risk of erroneous conclusions, the consequences of alternative judgments, and the understanding of an issue on the basis of available evidence.

D. Results and Conclusions

T-tests for two groups and one-way ANOVA analysis for multiple groups were used to test effects of respondent characteristics with respect to reflective judgment scores. The Pearson correlation statistic was calculated to explore bivariate correlations between respondent characteristics and reflective judgment scores.

The findings identified factors that appear associated with how the respondents make use of evidence to make decisions about their knowledge. The research results suggest that how the respondents make use of evidence may be associated with under/graduate/graduate status and with schools levels (elementary, middle school, high school).

Justification Levels (Use of Evidence)

The ability of undergraduate and graduate students to apply evidence was measured using the reflective judgment rubric, which included seven justification levels from 1.0 to 7.0. A score of 7.0 suggests use of a complex cognitive system for evaluating evidence. An independent samples t-test analysis indicated a statistically significant difference ($p>.05$) between the justification score means for graduate students (mean=3.82, n=59) and undergraduate students (mean=3.68, n=110). Approximately 60% of the graduate students achieved a score of 4.0 compared to about 40% of the undergraduate students.

The ability of undergraduate and graduate students to apply evidence was analyzed for differences by school level including elementary (n=85), middle school (n=32), and high school (n=52). Each of the three groups included undergraduate student pre-service teachers and graduate student in-service teachers. A one-way ANOVA analysis identified a statistically significant difference for high school level scores (mean=3.90) which exceeded both elementary (mean=3.66) and middle school (mean=3.62) group scores.

Respondent's justification scores had low positive correlations with age and the number of years teaching. A Pearson correlation coefficient (r=.25) was determined for the relationship between graduate student justification scores and number of years teaching. This group, which had taught for an average of 4.5 years, held a mean score of 3.82 on the justification measure. When all respondent ages were compared to justification scores, a Person correlation coefficient (r=.32) was calculated.

Knowledge Levels (Nature of Knowledge)

The research did not reveal differences among the groups with respect to how the respondents think about the nature of knowledge. The ability of the undergraduate and graduate students to view knowledge as uncertain and abstract was measured using a knowledge rubric with seven knowledge levels, ranging from 1.0 to 7.0. A score of 7.0 suggests an advanced understanding of knowledge. The respondent's knowledge score did *not* appear linked to (a) undergraduate or graduate status, (b) school level (elementary, middle school, high school), (c) age, or (d) number of years of teaching. An independent samples t-test analysis did not uncover a statistically significant difference ($p<.05$) between undergraduate and graduate student knowledge scores. Approximately 50% of the students in each group achieved a knowledge score of 4.0.

Knowledge level mean scores were compared for students in the elementary, middle school, and high school groups. A one-way ANOVA test did not reveal statistically significant differences ($p<.05$) among the groups. The high school group, with a knowledge mean score of 3.90, led the middle school (mean=3.62) and elementary (mean=3.66) groups.

Relationships between knowledge scores and factors including number of years of teaching and age were explored using a Pearson correlation statistic. Statistically significant relationships were not identified.

The relationship between respondent's knowledge and justification scores was examined. Justification scores exceeded knowledge scores in each of the three

school-level groups. A Pearson correlation coefficient (r=.27) was determined when knowledge scores and justification scores were compared.

E. Educational Significance

Regarding the methodology of the investigation, findings indicate that a writing assignment is an effective method for determining respondents' reflective levels. To check responses, selected respondents were interviewed to confirm the opinions expressed in the written assignment. All respondents verbally confirmed their written opinions. The ability to readily obtain information about the development of students' reflection levels has important instructional implications for the researchers and for teacher preparation programs.

Regarding knowledge levels, the finding of no significant difference between graduate and undergraduate respondents in their knowledge scores was surprising as was the lack of correlation between years of teaching and knowledge level scores. Surprising, when it might be expected that knowledge level scores would increase with time and experience in the classroom. These findings are supported by Harvey (1970) who determined that the abstract cognitive levels of college sophomores were higher compared to those of classroom teachers. The finding that 50% of in-service and pre-service teachers scored at knowledge level three was also perplexing. According to studies by King and Kitchener (1994), high school seniors score at a knowledge level of three. The practical implication is that level three teachers will believe what they read or hear regarding educational approaches without ascertaining biases, considering multiple sources of evidence, or determining context. This

stagnated development seems to indicate that there is little intellectual stimulation in schools to encourage teachers to higher levels of reflection and intellectual growth. What should teacher preparation programs do to develop reflective teachers?

Regarding justification levels, the study found a small mean difference between graduate and undergraduate students that revealed that scores for graduate students exceeded undergraduate students by a small measure. The study also revealed that high school education majors had higher justification scores than elementary and middle school education majors. This may indicate that justification can more easily be improved through educational experiences than can knowledge levels. Also, it is unclear if programs with more rigorous content requirements better prepare students to support and defend their ideas or if students with higher levels of reflection are attracted to more rigorous programs.

Acknowledging the modest positive result for graduate students, it was still disconcerting that 40% of graduate students produced an assignment with unsupported opinions, indicative of level 3 justification. In King and Kitchener's (1994) studies, the graduate student mean score was a level five. As an implication for instruction, these results indicate that both undergraduate and graduate students need intensive experiences in defending educational approaches and their own educational beliefs with respect to biases, multiple perspectives, and context.

Finally, one finding was particularly intriguing to the researchers. While the King and Kitchener (1994) model describe knowledge and justification separately, in reporting results, respondents received one score implying that knowledge and justification have parallel development. In the current study, researchers were

surprised to discover that some respondents scored a full level higher in justification than in knowledge. Specifically, some respondents scored a four in their level of justification but scored a three in knowledge level. The reverse was never found. This suggests that justification may precede knowledge development in some individuals.

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Organization/Address: Murray State University
P.O. Box 9 Murray, KY 42071

Telephone: (270) 762-3790

FAX: (270) 762-3799

E-Mail Address: renee.campoy@murraystate.edu

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